Rationale for the SSSI designation of the Swanscombe Peninsula

A report by Buglife, Kent Wildlife Trust and RSPB

January 2021

© Daniel Greenwood

Contents

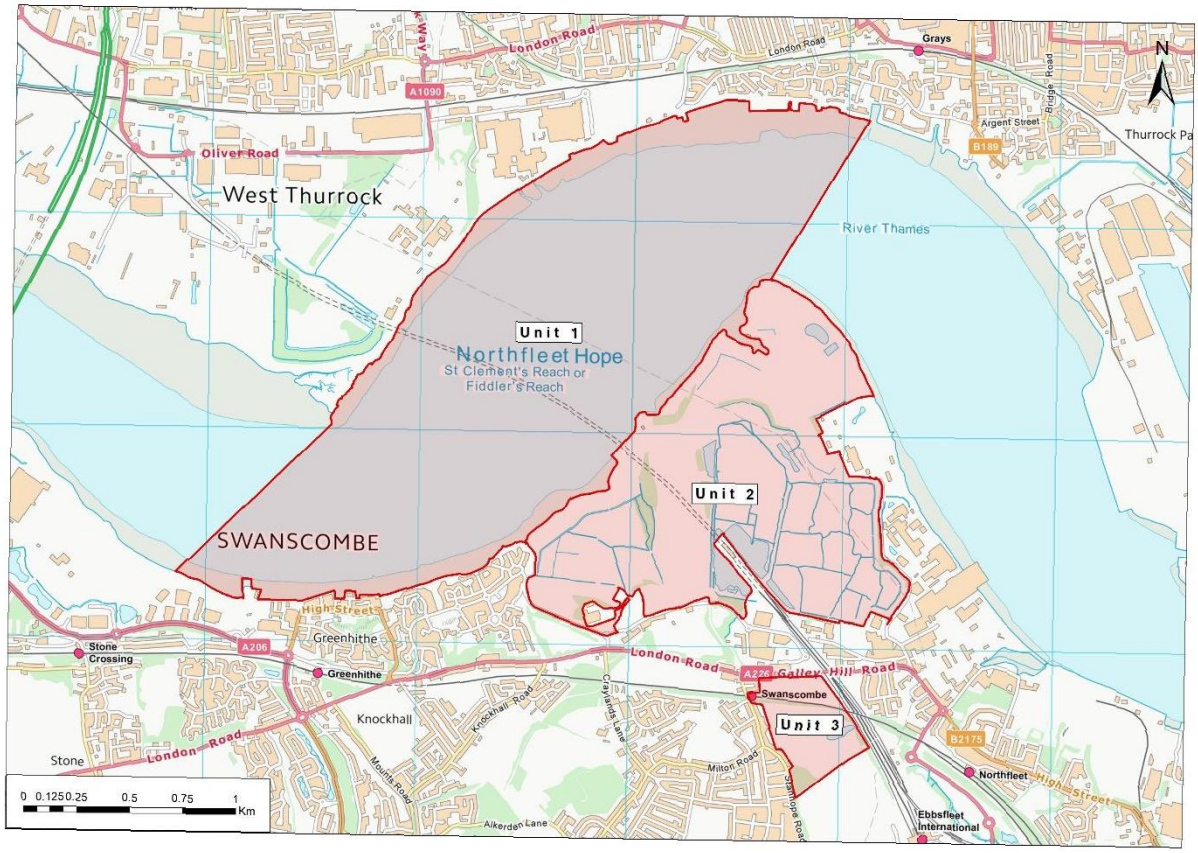
1.0 Introduction 3
1.1 Site summary 3
2.0 The biological SSSI selection criteria 5
2.1 The urgent need to represent OMHPDL and Thames Estuary invertebrates in the SSSI series 5
2.2 Site selection criteria 7
3.0 Appraisal of the Biological Interest of Swanscombe Peninsula 11
3.1 Invertebrates – Terrestrial and Freshwater 11
3.2 Invertebrates - subtidal 13
3.3 Birds 14
3.4 Plants 16
3.5 Habitats 17
3.6 Other interest 18
4.0 SSSI designation as a route to protecting key sites from development 18
5.0 Conclusion 19
Acknowledgements 21
Appendices 21
Appendix 1- Area of search showing remaining high quality OMHPDL sites and SSSI designations 21
Appendix 2- Comparison of biodiversity significance of Swanscombe with other key remaining Thames Estuary invertebrate sites 22
Appendix 3- 50 Red Data Book invertebrate species recorded on Swanscombe Peninsula 23

1.0 Introduction

This document outlines a rationale for the designation of the Swanscombe Peninsula as a SSSI bringing together information on the biodiversity value of the site and assessing it against the Joint Nature Conservation Committee (JNCC) '*Guidelines for the Selection of Biological SSSIs'* documents[1]. The assessment against the criteria is presented first, followed by an overview of the biological interest across all taxa.

Paragraph 3.4 of the SSSI Guidelines sets out a two-step process to determine special interest, firstly the descriptive recording of the biological attributes and physical environment, and then "*the evaluation of this information using established criteria, to determine the nature conservation value of a site*".

1.1 Site summary



Map 1: Swanscombe Peninsula. Contains Ordnance Survey OpenData © Crown copyright.

The Swanscombe Peninsula is located in the centre of the Thames Estuary and benefits from the estuary's unique climate, which is more continental than the rest of the UK (Map 1). Low rainfall causing soil water deficit, mild winters, and higher than average temperatures and sunshine levels in summer help to maintain dry, open habitats. These allow wildlife with Mediterranean elements to develop, many at the northerly limits of their range and unable to survive elsewhere in the UK[2]. Much of the important wildlife in the Thames Estuary is associated with dry, flower-rich, open

[1] JNCC (2019) *Guidelines for selection of biological SSSIs.* JNCC, Peterborough. Available from: https://jncc.gov.uk/our-work/guidelines-for-selection-of-sssis/ [Accessed 6th January 2021].

[2] Harvey, P. (2000) The East Thames Corridor: a nationally important invertebrate fauna under threat. *British Wildlife*, **12**, 91-98

grasslands on nutrient-poor sands and gravel traditionally found in the former Thames Terrace Grassland communities[3].

However, agricultural improvement and development pressure have led to widespread losses of these former Thames Terrace Grasslands and other terrestrial habitats, resulting in this characteristic fauna being increasingly dependent on the network of open habitats that develop on brownfields[4]. Such wildlife-rich brownfield sites develop as a result of abandonment and periodic disturbance across sites with low nutrient status and drought stress, creating diverse flower-rich mosaics. Many brownfield features mimic semi-natural habitats such as the Thames Terrace Grasslands that have now been lost from the wider landscape[5].

However, not all brownfields are wildlife-rich, with the term often referencing any previously developed land. Criteria have been developed to identify wildlife-rich brownfields, which are then referred to as Open Mosaic Habitats on Previously Developed Land (OMHPDL), a habitat of principal importance in Section 41 of the Natural Environment and Rural Communities Act (2006)[6].

The erection of high flood defences and coastal squeeze have also led to the loss of many of the coastal wetland habitats that support significant biodiversity in the Thames Estuary. Where brownfield habitats supporting flower-rich, nutrient poor soils and wetland features are found in close proximity, forming a tight mosaic of diverse habitats and underlying substrates and hydrology, sites can become refuges for high densities of rare and endangered species. In addition, the unique combination of Mediterranean climate, and the long-term presence of flower-rich, sparsely vegetated habitats adjacent to wetland habitats that makes Thames Estuary brownfields of such national biological significance.

The Swanscombe Peninsula and adjacent estuary supports a unique mosaic of coastal habitats, grasslands, scrub and wetlands that have developed as a result of the site's complex human history. The diversity of habitats, size and position within the Thames Estuary allow it to support an extraordinarily rich fauna and flora. The Swanscombe Peninsula is one of the last remaining large brownfield habitats in the Thames Estuary. Due to the pace and extent of development of these habitats in the region it is extremely vulnerable, A large part of the terrestrial site is identifiable as OMHPDL, a habitat which is suffering from significant losses in the Thames Estuary. Indeed, in the six years between 2007 and 2013, 51% of key brownfield biodiversity sites identified were either lost, damaged, or under threat from an existing planning permission in the Thames Estuary[7]. The current rapid destruction of these habitats is occurring despite the widespread recognition of the nationally important invertebrate assemblages associated that are being lost[8][9]

[3] Harvey, P. (2000) op. cit.
[4] Harvey, P. (2000) op. cit.
[5] Gibson, C.W.D. (1998) *Brownfield: red data. The values artificial habitats have for uncommon invertebrates*. English Nature Resource Report, No. IN54, Peterborough. Available online from: http://publications.naturalengland.org.uk/publication/127046 [Accessed 6th January 2021]
[6] JNCC (2010) UK Biodiversity Action Plan Priority Habitat Descriptions: Open Mosaic Habitats on Previously Developed Land. JNCC, Peterborough. Available from: https://data.jncc.gov.uk/data/a81bf2a7-b637-4497-a8be-03bd50d4290d/UKBAP-BAPHabitats-40-OMH-2010.pdf [Accessed 6th January 2021].
[7] Robins, J., Henshall, S., Farr, A. (2013) *The state of brownfields in the Thames Gateway*. Buglife- The Invertebrate Conservation Trust, Peterborough. Available from: https://cdn.buglife.org.uk/2019/08/The-State-of-Brownfields-in-the-Thames-Gateway_0_0.pdf [Accessed 6th January 2021]
[8] Gibson, C.W.D. (1998) op. cit.
[9] Barker, J. (2000) *Ecological recombination in urban areas: implications for nature conservation*. Proceedings of a workshop held at the Centre for Ecology and Hydrology, Monks Wood.

The site supports a nationally important assemblage of terrestrial invertebrates, populations of aquatic invertebrates of high conservation value, and a nationally significant population of the Tentacled lagoon-worm (*Alkmaria romijni*), the habitat of which is protected under the Wildlife & Countryside Act (WCA) (1981). In total there are over 250 invertebrate species of conservation concern, and 50 red listed species, including the Critically Endangered Distinguished jumping spider (*Attulus distinguendus*) – figures thought to be higher than on any other OMHPDL site in the UK. It also supports a regionally important breeding bird assemblage including 15 red-listed Birds of Conservation Concern and 12 Species of Principal Importance, 13 nationally scarce vascular plant species, including 5 red-listed species, and populations of reptiles, bats, Water vole (*Arvicola amphibious*) and Otter (*Lutra lutra*). The overall value and uniqueness of the site with its mosaic of habitats is demonstrated by the sheer taxonomic breadth of the species of conservation concern.

The Swanscombe Peninsula in North Kent is currently subject to a Nationally Significant Infrastructure Project (NSIP) application which was accepted for examination in January 2021. The recently submitted ecological information with the initial Environmental Impact Assessment and historic surveys have enabled the ecological and biodiversity significance of the site to be assessed properly for the first time. It is expected that more data will become available in due course, particularly relating to freshwater habitats and there is a significant chance that it will become apparent that the site is of even higher national significance for biodiversity conservation.

2.0 The biological SSSI selection criteria

2.1 The urgent need to represent OMHPDL and Thames Estuary invertebrates in the SSSI series

Despite the inclusion of OMHPDL as a Section 41 priority habitat and a detailed account in the 'UK Biodiversity Action Plan Priority Habitat Descriptions' which acknowledges its inherent variety, the habitat remains poorly represented in the SSSI series.

The opportunities to select a site that represents the range and juxtaposition of habitats that make these sites so important for biodiversity are in rapid decline. Reviews of the ecological resources included in the '*All of a Buzz in the Thames Gateway*' project and subsequent '*State of Brownfields in the Thames Gateway'* reports[10] show that the OMHPDL habitats are being rapidly lost, and apart from Canvey Wick SSSI, all other substantial, nationally significant sites such as the Lytag Brownfield Wildlife Site at Tilbury Power Station (part of Tilbury 2) have suffered losses of habitat area in recent years or are currently subject to an extant planning permission so are expected to be lost in the coming years.

Paragraph 2.11 of the JNCC's '*Guidelines for the Selection of Biological SSSIs. Part 1: Rationale, Operational Approach and Criteria for Site Selections*[11]*'* states that "*the 'special interest' of biodiversity features is not necessarily fixed in time. Some species or habitats may become more widespread and numerous and thus less threatened, whilst others may decline, so the remaining populations and areas will assume increased value and may require greater protection and/or better management*." This clearly applies to the loss of nationally significant brownfield sites within the

[10] Robins, J. et al. (2013) op. cit.

[11] JNCC (2019) *Guidelines for selection of biological SSSIs. Part 1: Rationale, Operational Approach and Criteria for Site Selections.* JNCC, Peterborough. Available from: https://data.jncc.gov.uk/data/dc6466a6-1c27-46a0-96c5-b9022774f292/SSSI-Guidelines-Part1-Rationale-2013.pdf [Accessed 6th January 20210

Thames Estuary, making the retention and protection of key remaining sites essential for the preservation of the habitat type. A nationally significant habitat resource supporting a unique assemblage of invertebrates has been consistently eroded, despite the designation of OMHPDL as a priority habitat type and planning policy to prevent biodiversity loss. Without urgent protection, there is the potential for the extirpation of the Distinguished jumping spider from the UK fauna.

Paragraph 2.7 of the JNCC's '*Guidelines for the Selection of Biological SSSIs. Part 1: Rationale, Operational Approach and Criteria for Site Selections'* states that "*The purpose of biological SSSIs is to safeguard the diversity and geographic range of habitats and species throughout Great Britain, within which the viable populations of all our threatened native species will be represented; as well as the full range of natural, near natural and semi-natural ecosystems*". Considering the national importance of wildlife habitats on the Thames Estuary, whether through the extensive coastal SSSI network or previous commitments to the Greater Thames Marshes Nature Improvement Area, the inclusion of what appears to be the most important site for its combined biodiversity value must be considered. OMHPDL is by its very definition extremely diverse, but important brownfield habitats and features remain poorly represented in the SSSI series, with the exception of a few sites, notably the notification of the Canvey Wick SSSI in 2005 following proper consideration of the established criteria, as is proposed for the Swanscombe Peninsula. With the additional data that has come to light from recent planning submissions, it is also now apparent that while the ecological make up and species profile of Swanscombe is distinct from that found at Canvey Wick and elsewhere, its biodiversity value exceeds that of other brownfield sites including the existing SSSIs.

Chapter 10 of the JNCC's '*Guidelines for the Selection of Biological SSSIs. Part 2: Habitat Chapters*[12]*'* for Artificial Habitats has not been updated since 1989, so does not accommodate Open Mosaic Habitat on Previously Developed land, despite it being an established priority habitat type. However, the importance of mosaic sites and site heterogeneity is acknowledged in *'Guidelines for the Selection of Biological SSSIs. Part 2: Species Chapters'*, in Chapter 20 for Terrestrial and Freshwater Invertebrates. Paragraph 1.6 confirms the important of such mosaics yet highlights that "*most of the SSSI series has been chosen to represent examples of the major habitat types, with sites supporting habitat mosaics…. having largely been omitted or overlooked*".

Swanscombe Peninsula supports an outstanding resource of OMHPDL, including wetland and grassland features, which are closely interlinked with semi-natural wetland, grassland and estuarine features. In combination these are of national significance for wildlife and the designation of this outstanding mosaic would address a notable lack of OMHPDL representation in the SSSI series.

Buglife and NE undertook a substantial joint strategic project on Thames Estuary brownfield biodiversity conservation that defined the resource and identified the priorities. '*All of a Buzz in the Thames Gateway*' concluded in 2008, with key recommendations including:

> "*to ensure that the most important sites for biodiversity – brownfield or otherwise – are properly identified and protected through local authority planning policy or, if appropriate, statutory designation*."

[12] JNCC (2019) *Guidelines for selection of biological SSSIs. Part 2: Habitat Chapters.* JNCC, Peterborough. Available from: https://data.jncc.gov.uk/data/35c4308a-9379-479e-9058-4b2bfbde45f3/SSSIs-Chapter10.pdf [Accessed 6th January 2021]

Since '*All of a Buzz in the Thames Gateway*', many biodiverse small sites have been, or are being destroyed leaving only a few larger sites, as the remaining significant biodiverse fragments. However, even these remaining sites are in various stages of jeopardy.

- **Canvey Wick SSSI** – Designated by NE in 2005, Canvey Wick is now a joint RSPB, Land Trust and Buglife nature reserve and under conservation management, although with large-scale and crucial habitat management work still pending. The corner of the SSSI was destroyed when a road was built through the SSSI.
- **West Thurrock Marshes** – Over a quarter of the site is now developed, including half of the most important invertebrate habitat. The SSSI area in the south has been rewetted so no longer contains large areas of open bare ground. The remaining interest on the non-SSSI part of the site in the north is in an unfavourable condition, although management is now being implemented by the Essex Wildlife Trust and the Land Trust to restore these areas.
- **Chafford Gorges** – Mostly now under housing development, but with several areas retained as scattered SSSI and Local Wildlife Sites, managed by the Essex Wildlife Trust. However, the retained areas are the main green space for the area so suffer from visitor pressure and management for visitors, with many of the best remnants of habitat small and fragmented.
- **Isle of Grain NP** – c.80% of habitat is expected to be destroyed by an approved application. Mitigation has been agreed for the long-term management of remaining areas, however, management is unlikely to maintain the site's interest due to soil contamination concerns.
- **Arena Essex** – A planning permission is currently being considered which would lead to the loss or gradual reduction in value of most key areas of the site.
- **Tilbury Power Station, including Lytag Brownfield Local Wildlife Site (Tilbury 2)** – The majority of the ash fields around the power station have now been 'restored' to arable land or have outstanding planning permissions. The Lytag Brownfield Local Wildlife Site and much of the associated habitats are expected to be lost as a result of the approved Tilbury 2 Nationally Significant Infrastructure Project.
- **Swanscombe Peninsula** – The majority of the site is earmarked for the London Resort theme park, with a NSIP application now accepted for examination by the Secretary of State for consideration.

Natural England's current designations programme includes an acknowledgement of the need to consider 'Thames Estuary Invertebrates, Essex and Kent' in future designation discussions[13]. This confirms Natural England's view that Thames Estuary invertebrates and the habitats on which they rely, should be given significant weight in SSSI selection.

2.2 Site selection criteria

This section outlines the biological interest and importance of Swanscombe Peninsula in the national context, but specifically within an Area of Search which is defined here as the 'All of a Buzz in the Thames Gateway' project boundary, previously utilised by Buglife and Natural England to quantify and assess the brownfield habitat resource in the region (see Appendix 1).The Code of Guidance on SSSIs, published by the Minister in 2003, states that the purpose of SSSIs is to "*safeguard for the*

[13] Natural England's designations programme- Updated 15 October 2020. https://www.gov.uk/government/publications/natural-england-designations-programme-for-areas-sites-and-trails/natural-englands-designations-programme [Accessed 7th January 2020].

present and future generations the diversity and geographic range of habitats, species and geological features"[14].

Biodiversity 2020: A strategy for England's wildlife and ecosystem services[15] 2011 established the principle that "*Natural England and other partners will ensure that management of SSSIs and other habitats takes better account of the requirements of a wider range of species. Natural England will consider the impact of climate change and other long-term processes on the existing SSSI network through its Notification Strategy, which will also identify gaps in the present coverage of priority habitats and species within the SSSI series*".

Paragraph 2.7 of '*Guidelines for the Selection of Biological SSSIs'* states that "*The SSSI series should therefore include our most important natural heritage assets".*

The criteria for SSSI selection are not rigid due to the broad range of habitat types, extent of habitats and their variability, thereby allowing for necessary subjectivity for NE to determine what is of 'special interest' and hence should be notified as an SSSI. However, there are a number of broad criteria to consider that are set out in Section 5 of the '*Guidelines for the Selection of Biological SSSIs'*, covering 'The principles of site evaluation and selection'. Here we put Swanscombe Peninsula into the context of these criteria:

- **Typicalness** - Brownfields and OMHPDL sites are by their nature hard to define and varied in the habitat features and species groups that they support, which includes species and assemblages often closely associated with specific habitat types. Paragraph 5.4.1 states that it is necessary, "*… to select sites both for their unusual features, and as good examples of typical features which also have special interest*". Swanscombe supports a suite of birds, plants and invertebrates that are typically associated with brownfield, wetland and estuarine habitats in the Thames Estuary. However, it also represents the best example of the OMHPDL habitat type, as identified by the significant biological data available. The National Vegetation Classification (NVC) is referred to as a useful framework for assessing typicalness, but it is a blunt instrument when investigating OMHPDL. Comparison of invertebrate data with other OMHPDL sites confirms that the site supports an unusually diverse assemblage of rare and scarce invertebrate species as well as the species more often thought of as brownfield specialists in the Thames Estuary.
- **Fragility** - There is currently little documented evidence of the success of recreating complex OMHPDL habitat. Any proposals for the recreation of extensive areas as mitigation for planning applications have either yet to be implemented or yet to be appropriately surveyed and their effectiveness assessed. Paragraph 5.5.1 of JNCC's guidance states that "*the greater the fragility of a feature, the higher its value, and those which cannot be re-created should be regarded as irreplaceable and accorded particular importance in site selection*". With an absence of evidence that the habitat can be successfully recreated, despite its anthropogenic origins, the precautionary principle must be considered and the remaining areas of OMHPDL assumed to be irreplaceable until it can be confirmed otherwise. Paragraph 5.5.2 states that, "*In general, the more complex an ecosystem is, the greater is the*

[14] Defra (2003) Sites of special scientific interest: encouraging positive partnerships - code of guidance. Defra, London. Available from: http://www.adlib.ac.uk/resources/000/076/893/DEFRA_SSSI_code.pdf [Accessed 19th January 2020]

[15] Defra (2011). Biodiversity 2020: A strategy for England's wildlife and ecosystem services. Defra, London. Available from: https://www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services [Accessed 6th January 2020]

difficulty of restoring it to its original richness and complexity". A complex mosaic of habitats exists at Swanscombe, with diverse substrate, hydrology and character as a result of the long history of mixed industrial activities on the Peninsula, with no evidence to suggest that it can be readily replicated. Paragraph 5.5.2 also states that "*The capacity to restore a habitat may be a better measure of fragility than any other single factor or criterion practice are likely to those that are particularly difficult to restore*."

- **Size** - Swanscombe Peninsula is one of the largest remaining brownfields sites without an extant planning permission in the Thames Estuary. The site has been described as 465ha in recent planning submissions, larger than any of Canvey Wick (93ha), West Thurrock Marshes (31ha), the remaining areas of Chafford Gorges (60ha), Arena Essex (24.4ha) or the original footprint of the Isle of Grain (189ha), and indeed them all combined. The Tilbury Power Station areas subject to the Tilbury 2 application covered an area of 65ha, although the ash fields previously covered a notably wider area. At 465ha, Swanscombe therefore represents an opportunity to protect a nationally significant area of OMHPDL. Paragraph 5.7.1 states that, "*The size (extent) of a site is important because larger sites tend to be more species rich, have more viable species populations (because the populations are larger), contain more types of habitat, more subsidiary habitats and greater structural diversity*". It is notable that this extensive area includes not just the OMHPDL areas, but associated wetlands, grasslands, scrub, estuarine and coastal habitats that form a connected functional landscape for wildlife that spans the river across to West Thurrock Marshes SSSI on the northern banks. The potential functional value of this site is therefore significantly greater than its size suggests.
- **Diversity** - The mosaic of habitats and diversity of species have been shown to be exceptional on the Swanscombe Peninsula, as outlined in the supporting information following. OMHPDL habitats can be extremely diverse in their origin, the habitats present and their relative biodiversity value, making relative comparison of the diversity of habitats difficult between sites. However, it is clear that Swanscombe supports diverse dry and wetland features of high value for wildlife across taxa, thanks to its complex industrial history, underlying substrates and the diverse hydrology and topography supported. With regards to invertebrates in particular, Swanscombe is demonstrably more species-rich and supports a greater number of rare and scarce species than other sites acknowledged to support nationally significant invertebrate populations, as shown in Appendix 2.
- **Naturalness** - Much of the Swanscombe Peninsula is clearly highly unnatural, due to the sea wall separating the site from the tidal influence of the Thames and the history of industrial activity which has shaped the site for many decades. However, the site continues to support remnant natural features, notably grassland and wetland features which are natural in origin albeit disconnected from the influence of the Thames. In addition, the invertebrate communities of note are themselves natural, particularly the assemblages historically associated with the Thames Terrace Grassland which are now almost entirely reliant on brownfield sites such as Swanscombe Peninsula for their persistence.
- **Rarity (Habitats)** - OMHPDL remains a declining habitat type, with the nationally important Thame Estuary resource of the habitat suffering acutely, as documented in the '*State of Brownfields in the Thames Gateway*' report. As this document has outlined, the vast majority of large OMHPDL sites have either already been lost, suffered sizeable losses in their extent or have outstanding planning consents which are expected to lead to their imminent loss. It is stated in Paragraph 5.10.1 that "*Habitats that are rarer are given higher priority, simply because options and opportunities for conserving them are more limited and if all such habitats are lost, so too are the species and processes associated with them…. The scarcer*

the habitat, the stronger is the case that the qualifying standard should be more flexible." With continued ongoing losses, it is arguable that OMHPDL represents one of the most threatened habitat types in the UK, with habitat becoming increasingly rare in the Thames Estuary. The guidelines also state that, "*in general, the rarer the habitat, the larger is the proportion of the total area which should be protected*" supporting the designation of the extensive areas of habitat at Swanscombe. While the site supports 50 Red Data Book species among its 250 invertebrate species of conservation concern. There are no other sites in the UK that have recorded more than 50 extant red listed species, this means that Swanscombe is the highest ranked UK site on this criterion.

- **Rarity (Species)** - As discussed in Paragraph 5.10.2, some species are naturally rarer than others and rarity may also be a symptom of being at the edge of their range. However, there remains an abundance of species of conservation concern, and of particular note, the site supports one of two UK populations of the Critically Endangered Distinguished jumping spider. Chapter 20 of the JNCC's '*Guidelines for the Selection of biological SSSI*[16]*s'* covering 'Terrestrial and Freshwater Invertebrates' states clearly that, ""*All sites that support species assessed as Critically Endangered, Endangered and Vulnerable for Great Britain using IUCN criteria should be considered for notification*". It is not unreasonable to suggest the site may support 50% of the UK population without the benefit of extensive study. The future of the species should therefore be considered at risk with the site remaining undesignated. The site also supports other threatened invertebrate species, including the Endangered Duffey's bell-head spider (*Praestigia duffeyi*) and the Vulnerable Orange-striped water beetle (*Graphoderus cinereus*) and several Near Threatened species. The Swanscombe Peninsula Marine Conservation Zone also supports habitat protected under WCA for its nationally significant population of the Tentacled lagoon-worm. When Endangered, Nationally Scarce and red-listed plant and bird species are also considered, such as Man orchid (*Aceras anthropophorum*), Nightingale (*Luscinia megarhynchos*) and Black redstart (*Phoenicurus ochruros*) as detailed later in this document, the site supports an impressive list of rare and threatened species.
- **Ecological coherence** - Swanscombe Peninsula is one of the largest blocks of mixed wildlife habitats remaining in the Thames Estuary. At the site level it is likely to provide for the needs of some individual species of conservation concern in its own right, for example, less mobile species such as the Distinguished jumping spider. However, it is also likely to play a pivotal role in the ecological network underpinning invertebrate populations in the Thames Estuary. With OMHPDL and open habitats becoming increasingly rare in the Thames Estuary, local losses of species from surrounding sites are likely to increase, making the Swanscombe Peninsula an increasingly vital refuge of species. The scale of the site and its positioning suggests that it is likely to be crucial in maintaining sustainable populations of mobile invertebrates in the Thames Estuary, including of numerous Section 41 species. Work by the University of East London has established that the scarce bumblebee species in the estuary depend on multiple large areas of flower rich brownfield land for their survival[17].

[16] Curson J., Howe, M, Webb, J., Heaver D. & Tonhasca, A. (2019). Guidelines for the Selection of Biological SSSIs Part 2: Detailed Guidelines for Habitats and Species Groups. Chapter 20 Invertebrates. Joint Nature Conservation Committee, Peterborough.https://data.jncc.gov.uk/data/747968a5-a8a7-4bd6-b12c-3329c3b5b6ca/SSSI-Guidelines-20-Invertebrates-2019.pdf [Accessed 7th January 2021]

[17] Connop, S., Hill, T., Steer, J., Shaw, P. (2010) Microsatellite analysis reveals the spatial dynamics of *Bombus humilis* and *Bombus sylvarum*. Insect Conservation and Diversity **4**(3): 212-221. Available from:

- **Potential value** - The site, although demonstrably supporting nationally important populations of invertebrates, also meets the selection criterion for 'potential' in Paragraph 5.12.1, as "*vegetation succession can be fairly readily… deflected by suitable managemen*t". The biodiversity of the Swanscombe Peninsula has thrived despite very limited management intervention in some areas for many years, however, in the long term the site would clearly benefit from the introduction of conservation management, such as scrub clearance of some portions of the site. If neglected for several more decades without conservation focussed management, the biological importance of the site is likely to decline.
- **Recorded History** - Although Swanscombe has been used for bird watching for many decades, it does not benefit from an extensive recording history. Despite the initial surveys recently made available, there remain survey data gaps compared to other nearby established wildlife sites and designated sites.
- **Exemplary site** - Swanscombe represents potentially the highest quality OMHPDL and brownfield site in the Thames Estuary, and hence the UK, as demonstrated by publicly available data. Paragraph 5.14.2 describes the "*essence of the exemplary site principle procedure is that all of the examples of habitats and assemblages within an AoS are compared, to identify the best, and it is only these which are selected".* On the basis of known publicly available summaries of the faunas and floras of sites across the UK, the Swanscombe Peninsula exceeds all the most lauded sites in terms of the number of species of conservation concern, and Red Data Book species present. No other site in the Thames Estuary has recorded more than 36 extant red listed species, while Swanscombe supports 50 red listed species. Swanscombe is undoubtedly the exemplary OMHPDL habitat.

Our assessment is that Swanscombe Peninsula comfortably meets several of the criteria to be considered for designation as an SSSI.

3.0 Appraisal of the Biological Interest of Swanscombe Peninsula

It is noted in Paragraph 7.1 of the SSSI Guidance that "*In practice, there are often both habitat and species qualifying interests on a single site…. Thus, while the evaluation process is dealt with in a sectional way, it is necessary to take account of the combined value of habitats and species groups*". Paragraph 7.3 states that "*the guiding principle is that for sites which are considered to be important but which do not clearly qualify on a single feature interest, specialist advice should be sought and the combined value of all biological components should be taken into account, as long as the decision-making is transparent and explicable*."

This section draws together the known information on the site's various habitats and species to adjudge the case for SSSI designation of the Swanscombe Peninsula based on the combined value of its habitats and species.

3.1 Invertebrates – Terrestrial and Freshwater

Paragraph 3.10 of the JNCC's guidance document '*Part 2: Species Chapters*', Chapter 20 for Terrestrial and Freshwater Invertebrates states that "*All sites that support assemblages which are of either national or international importance should be selected*" and that "*Habitat based assemblages*

https://repository.uel.ac.uk/download/f5bf7baeb75389d2e9fa8ff22e83040a02450a200c08cd73bf178ed54a53dc27/388433/Connop_2010.pdf [Accessed 8th January 2021]

that should be represented in the series are those whose quality is high when compared to similar sites in the same geographical area or AoS". The combined terrestrial invertebrate surveys from 2012 and 2015 which are in the public domain reveal that 250 species of conservation concern (Red Data Book or Nationally Scarce) have been recorded[18][19]. In comparison, Canvey Wick and West Thurrock Marshes, long considered to be the best national examples of OMHPDL habitat, which both support around 150 species of conservation concern each. Swanscombe supports 50 IUCN Red Listed species, while neither Canvey Wick nor West Thurrock Marshes exceed 36 Red Data Book species (see Appendices 2 and 3). Being home to the longest list of red listed and nationally scarce species of any brownfield site in the UK means that the site is of unrivalled national significance.

The site supports many other species identified as Endangered and Vulnerable, as well as an outstanding suite of species considered to be nationally rare or scarce, including those estimated to occur in 1-15 10km hectads which "*should also be represented, where possible*" as outlined in Paragraph 3.5. Paragraph 3.6 also confirms the relevance of Section 41 listing in the Natural Environment and Rural Communities Act (2006) "*where notification is an appropriate mechanism for conservation*". Although the Section 41 species list for Swanscombe does include many which are wide-ranging, the list of invertebrate Section 41 species is impressive and is indicative of the site's potential importance as a mechanism for conservation: Sea aster mining bee (*Colletes halophilus*), Brown-banded carder bee (*Bombus humilis*), Phoenix fly (*Dorycera graminum*), Black-headed mason wasp (*Odynerus melanocephalus*), Five-banded weevil wasp (*Cerceris quinquefasciata)*, Saltmarsh shortspur beetle (*Anisodactylus poeciloides*), Yellow-striped bear-spider (*Arctosa fulvolineata*), in addition to a number of declining Lepidoptera species.

JNCC's guidance document '*Part 2: Species Chapters*', Chapter 20 for Terrestrial and Freshwater Invertebrates states:

"*All sites that support species assessed as Critically Endangered, Endangered and Vulnerable for Great Britain using IUCN criteria should be considered for notification*"

The presence of the Critically Endangered Distinguished jumping spider therefore makes this site a priority for consideration. As the Distinguished jumping spider is found on only two sites nationally, parts of Swanscombe Peninsula supporting this species would therefore meet the interest test on the basis of its presence alone. In addition, the site may be crucial for the persistence of the Endangered Duffey's bell-head spider which is recorded on the site, as according to the 2017 status review, "*most of the known populations are vulnerable and in extremely localised habitats threatened by development, recreational pressures and rising sea levels… At the present rate most of the habitat will have been lost within a few decades*.[20]"

[18] Chris Blandford Associates Ltd (2012). London Paramount- 2012 Terrestrial Invertebrate Survey Report. A report for Chris Blandford Associates. Available from: https://londonresort.info/media/1136/lr-peir-app-121-ecology-baseline-report-part2.pdf [Accessed 8th January 2021]

[19] Edwards Ecological Services Ltd (2015). Invertebrate Survey and Assessment of the Paramount Entertainment Resort. A report for Chris Blandford Associates. Available from: https://londonresort.info/media/1136/lr-peir-app-121-ecology-baseline-report-part2.pdf [Accessed 8th January 2021]

[20] Harvey. P., Davidson, M., Dawson, I., Fowles, A., Hitchcock, G., Lee, P., Merrett, P., Russel-Smith, A., and Smith, H. (2017). *A review of the scarce and threatened spiders (Araneae) of Great Britain: Species Status No.22*. NRW Evidence Report No: **11**, 101pp, Natural Resources Wales, Bangor. Available from: http://britishspiders.org.uk/wiki2015/images/1/10/Spider_Status_Review_2017.pdf [Accessed 8th January 2021]

The aquatic invertebrate interest also appears to be of significance at the county and regional level. Surveys already in the public domain relating to the accepted NSIP application have identified what is described as an "*exceptionally rich aquatic macroinvertebrate assemblage*" with 199 species recorded. This includes the IUCN Vulnerable Orange-striped water beetle (*Graphoderus cinereus*), 3 Near Threatened water beetle species, 10 Nationally Scarce species and 42 Local Species. Across the site, two thirds of communities were assessed as being of Very High Conservation Value using the Community Conservation Index (CCI). For water beetles alone, the Water Beetle Species Quality Index score of 2.9, is comparable with grazing marshes of a similar score being placed between county and regional status, with county importance being defined as a candidate SSSI. Foster and Eyre (1992) report water beetle SQIs for 392 sites in Sussex, Surrey and Kent, Swanscombe scores in the top 4% of these sites[21]. There is also the important potential for brackish waterbodies to support populations of the Tentacled-lagoon worm, demonstrating an ecological link to the subtidal habitats of the adjacent Marine Conservation Zone (MCZ).

3.2 Invertebrates - subtidal

The Swanscombe MCZ in the tidal Thames adjacent to the Peninsula (which is likely to be impacted by the shipping and dredging proposals associated with the development proposals) has been notified on the basis of its important population of the Tentacled lagoon-worm and intertidal mud habitat[22].

The Tentacled lagoon-worm is a small ampharetid polychaete worm, found in lagoons and tidally-restricted estuarine sites in the southern UK mainland from Wales and Cornwall through Hampshire to Humberside[23]. This species, and the habitat in which it occurs receives protection under Section 9(4)(a) of the WCA (as amended).

The addition of an SSSI designation to the MCZ designation would bring the site into line with nearby estuarine MCZs in the Colne, Blackwater, Medway and Swale, all of which are also designated as SSSIs.

The seven site selection principles for subtidal SSSIs are set out in Para 4.4 of '*Part 2: Habitat Chapters- Chapter 1b Marine Intertidal and Shallow Subtidal Habitats'* [24] of the SSSI selection guidelines.

- "*The site includes the best example of a particular habitat type with its associated communities within that AoS*. " The Swanscombe MCZ is the only site designated for the

[21] Foster, G.N., & Eyre, M.D. (1992) *Classification and ranking of water beetle communities.* JNCC, Peterborough.
[22] Defra (2019) *Swanscombe Marine Conservation Zone Factsheet*. Defra, London. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/915349/mcz-swanscombe-2019.pdf [Accessed 8th January 2021]
[23] Gilliland, P.M., & Sanderson, W.G. (2000). e-evaluation of marine benthic species of nature conservation importance: a new perspective on certain 'lagoonal specialists' with particular emphasis on *Alkmaria romijni* Horst (Polychaeta: Ampharetidae). *Aquatic Conservation* **10**, 1 (1-12).
[24] Brazier, D.P., Hiorns, N., Kirkham, E., Singfield, C., Street, M., Steel, L. & Kent, F. (2019). Guidelines for the Selection of Biological SSSIs. Part 2: Detailed Guidelines for Habitats and Species Groups. Chapter 1b Marine Intertidal and Shallow Subtidal Habitats. Joint Nature Conservation Committee, Peterborough. Available from: https://data.jncc.gov.uk/data/3e8b58d8-ff6b-4bc6-ba4f-aeed92710e14/SSSI-Guidelines-1b-MarineIntertidal-ShallowSubtidal-2019.pdf [Accessed 8th January 2021]

Tentacled lagoon-worm in Eastern England (there are three estuarine MCZs containing the species in South Devon).

- "*The site contains a variety of high quality marine features (Section 4.5) which represent the range and variation within that AoS*"- The site contains a full range of habitats present in this stretch of the Thames estuary, from high tide exposed mud flats to subtidal sediments.
- "*The site contains good quality examples of specialised habitats such as rockpools, overhangs, caves and gullies or unusual features in addition to 1 and 2 above*"- The estuary is by its nature composed of extensive areas of similar habitat and lacks the range of features that may be found on a rocky coast for instance, there are however a number of jetties and embayments.
- "*The site contains habitat or community features of a restricted nature on a national or international (north-east Atlantic) basis (see Annex 1 for habitat and biotope list*)"- The site contains the following annex 1 habitats: SS.SMu.SMuVS. Sublittoral mud in variable salinity; SS.SMu.ISaMu. Infralittoral sandy mud; SS.SMu.IFiMu Infralittoral fine mud; and LS.LMx Littoral mixed sediment.
- "*The site has a complete zonation down the shore or from fresh to saline environment including, where relevant, mature community types*"- The site contains good examples of zonation of locally typical estuarine biotopes.
- "*The site contains one or more marine species currently considered nationally rare or scarce including those listed in schedules 5 and 8 of the Wildlife & Countryside Act 1981 (as amended)*"- The site is a key refuge for the Tentacled lagoon-worm which is a nationally scarce marine species and is listed on the WCA, 1981.
- "*The site is a large area or length, either continuous or in several discrete units depending on the degree of natural and man-made interruptions*"- The Swanscombe SSSI would abut with the West Thurrock Lagoon and Marshes SSSI, which includes a 1.5 stretch of intertidal salt marsh on the north side of the Thames. This would create an extensive SSSI protected area spanning both sides of the River Thames and would protect intertidal mud flats along over 4 km of the Thames downstream of the Dartford crossing.

The marine invertebrate populations and their associated habitats are of high interest and ranks with or above other designated sites in the Area of Search.

3.3 Birds

Section 3.6 of the '*Guidelines for the Selection of Biological SSSIs' Part 2: Species,* Chapter 17 for Birds[25] sets out that sites with high numbers of Species of Principal Importance (SPI) or red-listed Birds of Conservation Concern (BoCC) should be given consideration for SSSI designation. Breeding bird surveys conducted as part of the proposed London Resort development recorded 12 SPI and 15 red-listed BoCC species from the 2020 surveys. This includes a number of species identified as rare breeding birds[26] (Table 1)[27].

[25] Drewitt, A.L., Whitehead, S. and Cohen, S. (2020). *Guidelines for the Selection of Biological SSSIs. Part 2: Detailed Guidelines for Habitats and Species Groups. Chapter 17 Birds* (version 1.1). Joint Nature Conservation Committee, Peterborough. Available from: https://data.jncc.gov.uk/data/16bd76ad-bb74-4724-9e06-5df02b459524/SSSI-Guidelines-17-Birds-2020revised-A.pdf [Accessed 8th January 2020]

[26] https://www.rbbp.org.uk

[27] The Environmental Dimension Partnership Ltd (2020) *Appendix 12.1: Ecology Baseline Report.* A report for London Resort Company Holdings Limited. Available from: https://londonresort.info/media/1135/lr-peir-app-121-ecology-baseline-report-part1.pdf [Accessed 20th January 2021].

Species	2020 survey	Birds of Conservation Concern	Rare Breeding Birds	Schedule 1 species	Species of Principal Importance
Bearded Tit	3-5 pairs	Amber	Y	Y	-
Black Redstart	1 pair	Red	Y	Y	-
Bullfinch	c. 4 pairs	Red	-	-	Y
Cuckoo	Up to 9	Red	-	-	Y
Dunnock	40-45 pairs	Amber	-	-	Y
Gadwall	4-6 pairs	Amber	-	-	-
Grasshopper Warbler	5-11 pairs	Red	-	-	Y
Greylag Goose (feral)	Up to 12 pairs	Amber	-	-	-
Grey Wagtail	1 pair	Red	-	-	-
House Sparrow	4-5 pairs	Red	-	-	Y
Kestrel	c. 2 pairs	Amber	-	-	-
Kingfisher	1 pair	Amber	-	Y	-
Lapwing	1 pair	Red	-	-	Y
Linnet	12-16 pairs	Red	-	-	Y
Marsh Harrier	1 pair	Amber	Y	-	-
Marsh Tit	1 pair	Red	-	-	Y
Mistle Thrush	c. 4 pairs	Red	-	-	-
Nightingale	3-4 pairs	Red	-	-	-
Oystercatcher	2 (peak of 4)	Amber	-	-	-
Pochard	4-7 pairs	Red	Y	-	-
Reed Bunting	3-9 pairs	Amber	-	-	Y
Shelduck	5-10 pairs	Amber	-	-	-
Shoveler	2 pairs	Amber	Y	-	-
Skylark	7-8 pairs	Red	-	-	Y
Song Thrush	36-44 pairs	Red	-	-	Y
Spotted Crake	Up to 1 pair	Amber	Y	-	-
Starling	Up to 12 pairs	Red	-	-	Y
Stock Dove	c. 5 pairs	Amber	-	-	-
Swift	Up to 15 pairs	Amber	-	-	-

Table 1: 2020 Swanscombe breeding bird assemblage and conservation status

Section 3.8 states that, "*Localities which support an especially good range of bird species characteristic of a particular habitat, as defined by an index value, will qualify for SSSI selection*". Although there are no thresholds or comparative data for mosaic sites such as Swanscombe which contain extensive OMHPDL tightly interlinked with grassland and wetland features, the site supports a breeding bird assemblage of regional significance. Breeding bird surveys conducted as part of the proposed London Resort development in 2020 recorded 82 species. Based on accepted metrics for comparing the ornithological interest of sites, Swanscombe scores at the upper end of the 'regionally important' category (70-84), with the threshold for 'national importance' is 85 species[28].

[28] Fuller, R.J. (1980). *A method for assessing the ornithological interest of sites for conservation*. Biological Conservation Vol 17: 229-239.

Comparable breeding bird data is not readily available for SSSIs in the region, but the importance of the site can be demonstrated when compared to the 10 year mean breeding bird data for the RSPB's wetland reserves in the south east (Table 2).

Reserve	Breeding species
Pulborough Brooks (Sussex)	68
Northward Hill (Kent)	66
Dungeness (Kent)	62
Rainham Marshes (Essex)	51
Cliffe Pools (Kent)	51
Amberley Wildbrooks (Sussex)	49
Great Bells Farm (Kent)	34
Higham Marshes (Kent)	32
Harty Marshes (Kent)	21

Table 2: 10-year mean (2010-2019) of breeding bird species on RSPB reserves

Paragraph 10.1 of the JNCC's '*Guidelines for the Selection of Biological SSSIs. Part 1: Rationale, Operational Approach and Criteria for Site Selection'* that highlights when discussing the '*evaluation of species group combinations'* that "*Any site which narrowly fails to qualify for selection under one species group (and does not qualify on habitat criteria) should be examined for additional significant interest under other groups. Aggregations of regionally or locally rare species also need to be considered for site selection.*" A regionally important breeding bird assemblage, including multiple red-listed BoCC species, further highlights the significant biological value of the Swanscombe Peninsula.

3.4 Plants

Botanical surveys submitted in support of the London Resort Environmental Statement in 2012, 2016 and 2020, have confirmed the presence of 13 Nationally Scarce species (Table 3), including the Endangered Man orchid (*Orchis anthropophora*), and four Vulnerable species: Yellow vetchling (*Lathyrus aphaca*), Bithynian vetch (*Vicia bithynica*), Slender hare's-ear (*Bupleurum tenuissimum*) and Divided sedge (*Carex divisa*)[29][30][31][32]. There appear to be notable differences in distribution over time, indicating a dynamic habitat mosaic.

[29] Chris Blandford Associates (2012). London Paramount- 2012 Botanical Survey Report. A report for London Resort Holdings (LRCH) Ltd.

[30] Chris Blandford Associates (2016). London Paramount Entertainment Resort- Phase 1 and Botanical Survey Report. A report for London Resort Holdings (LRCH) Ltd

[31] The Environmental Dimension Partnership Ltd (2020). *The London Resort. Appendix 12.1 Ecology Baseline Report*. A report for A report for London Resort Holdings (LRCH) Ltd. Available from: https://londonresort.info/media/1135/lr-peir-app-121-ecology-baseline-report-part1.pdf [Accessed 11th January 2020].

[32] Stroh, P., Leach, S.J., August, T.A., Walker, K.J., Pearman, D.A., Rumsey, F.J., Harrower, C.A., Fay, M.F., Martin, J.P., Pankhurst, T., Preston, C.D., Taylor, I. (2014) *A Vascular Plant Red List for England*. Botanical Society of Britain and Ireland, Bristol. Available from: https://www.researchgate.net/publication/266470075_A_Vascular_Plant_Red_List_for_England [Accessed 11th January 2021]

Common name	Scientific name	Nationally Scarce	Red List status
Brackish watercrowfoot	*Ranunculus baudotii*	Yes	Least Concern
Roundleaved wintergreen*	*Pyrola rotundifolia* ssp. *Maritima*	Yes	Least Concern
Yellow vetchling	*Lathyrus aphaca*	Yes	Vulnerable
Hairy vetchling	*Lathyrus hirsutus*	Yes	Waiting List
Bithynian vetch	*Vicia bithynica*	Yes	Vulnerable
Sickle medick	*Medicago sativa* ssp. *Falcata*	Yes	Least Concern
Slender hare's-ear*	*Bupleurum tenuissimum*	Yes	Vulnerable
Golden samphire	*Inula crithmoides*	Yes	Least Concern
Man orchid	*Orchis anthropophora*	Yes	Endangered
Divided sedge	*Carex divisa*	Yes	Vulnerable
Annual beard-grass	*Polypogon monspeliensis*	Yes	Least Concern
Borrer's saltmarsh grass*	*Puccinellia fasciculata*	Yes	Near Threatened
Stiff saltmarsh grass*	*Puccinellia rupestris*	Yes	Least Concern

* Recorded by Kent Biological Recording Group (KBRG) between 2012 and 2015

Table 3: Nationally Scarce vascular plant species recorded from the Swanscombe Peninsula

The JNCC's '*Guidelines for selection of biological SSSIs. Part 2: Species- Chapter 11 Vascular Plants'* section 3.3 states that site selection can be based on "*Combination of species occurring in 1-100 10 km squares"*[33]. For selection under this criteria, "a *simple scoring procedure is used to assess combinations of species within the two classes, nationally rare and nationally scarce*". Using this system, a score of 200 is required for selection as a SSSI, with a score of 50 given to Nationally Scarce species.

The 2016 botanical report states that, "*On the basis of the 13 species recorded, on the Swanscombe Peninsula the grassland and early successional/ruderal habitats where these species are present would score 550, and with the saltmarsh (golden samphire) and ponds and ditches (brackish water-crowfoot) would score 650. Based on this at least parts of the Swanscombe Peninsula would be eligible for selection as both SSSI and Local Wildlife Site*"[34]. It does, however, caveat that some of these populations are relatively small. Regardless, the score of 650 clearly exceeds the threshold of 200 required for SSSI selection.

3.5 Habitats

The Swanscombe peninsula supports a mosaic of habitats as a result of its complicated history, with its coastal marshes and grassland habitats subject to landfill and the dumping of cement waste over many decades. It also plays host to water treatment works, the HS1 railway, and jetties, creating a diverse range of habitats in a mosaic across the site established on the varying underlying substrates, hydrology and topography. Many of these areas qualify as priority habitat under Section 41 of the Natural Environment & Rural Communities Act (2006), including Open Mosaic Habitat on

[33] JNCC (1989). *Guidelines for the Selection of Biological SSSIs. Part 2: Detailed Guidelines for Habitats and Species Groups. Vascular Plants*. JNCC, Peterborough. Available from: https://data.jncc.gov.uk/data/04b923cd-7658-4b8c-bead-4a65c3af330e/SSSIs-Chapter11.pdf [Accessed 11th January 2020].

[34] Chris Blandford Associates (2016) London Paramount Entertainment Resort: Phase 1 and Botanical Survey Report. A report for London Resort Company Holdings (LRCH) Ltd. Available from: https://londonresort.info/media/1135/lr-peir-app-121-ecology-baseline-report-part1.pdf [Accessed 26th January 2021].

Previously Developed Land (OMHPDL), coastal and floodplain grazing marsh, grasslands, scrub, saltmarsh and reedbed as well as other scattered habitat features. It is this site-wide distribution of different habitats that supports its significant interest and makes it essential that the entire site is protected as a single functional ecological unit.

The site represents one of the best remaining brownfield and OMHPDL sites in the Thames Estuary, a habitat type acknowledged by Natural England to support a nationally significant assemblage of invertebrates, including some found nowhere else in the UK[35]. In 2008, Buglife and Natural England completed the '*All of a Buzz in the Thames Gateway*' project which quantified the extent of this habitat resource likely to support priority species. In 2013, the '*State of Brownfields in the Thames Gateway*' report revisited this dataset and showed that over just six years, 51% of the wildlife-rich brownfields identified had been lost, damaged or were under immediate threat due to an outstanding planning permission[36]. In recent years we have seen continued losses of significant resource of small to medium sites and large sites either lost or now with an outstanding permission, including the Tilbury Power Station and Lytag Brownfield Local Wildlife Site and its nationally important habitats and species.

The adjacent estuarine habitats are 'transitional waters' that are 'substantially influenced by freshwater flows' they are hence eligible for SSSI designation[37]. The intertidal mud supports the Tentacled lagoon-worm feature and is a highly productive ecosystem that provides important feeding grounds for wading and migratory birds.

3.6 Other interest

The Swanscombe Peninsula also supports populations of other species groups which meet the Kent Wildlife Trust's criteria for selection and delineation of Local Wildlife Sites, further highlighting the significance of the site for nature conservation in the Thames Estuary[38]

The site supports exceptional populations of Common lizard (*Zootoca vivipara*) and Slow worm *(Anguis fragilis)*, with the London Resort's Ecology Baseline Report stating that "*The extent of the wetland habitat and waterbodies within the Kent Project Site has the potential to support large numbers of amphibians and records suggest that smooth and palmate newt, common toad and common frog are present.*" The site would also qualify as a Local Wildlife Site due to the presence of breeding populations of both Water vole and Dormouse (*Muscardinus avellanarius*), and the site is considered locally important due to an assemblage of at least nine bat species, including the Nationally Rare Barbastelle (*Barbastella barbastellus*).

4.0 SSSI designation as a route to protecting key sites from development

One of the purposes of SSSI designation is to protect nationally significant sites from development. Paragraph 2.2 of the JNCC's '*Guidelines for the Selection of Biological SSSIs. Part 1: Rationale,*

[35] Harvey, P. (2000) op. cit.
[36] Robins, J. et al. (2013) op. cit.
[37] Brazier, D.P. (2019) op. cit.
[38] Kent Wildlife Trust (2015). *Local Wildlife Sites in Kent: Criteria for Selection and Delineation*. *Version 1.5*. Kent Wildlife Trust, Sandling. Available from: https://www.kentwildlifetrust.org.uk/sites/default/files/2018-07/Local_Wildlife_Sites_in_Kent-Selection%26Delineation_v1.5_Oct2015.pdf [Accessed 11th January 2020].

Operational Approach and Criteria for Site Selections' states while discussing the origins of the SSSI network from the National Parks and Access to the Countryside Act 1949 that:

"*The areas of special interest were specifically differentiated from nature reserves as 'not being land for the time being managed as a nature reserve', but which were of sufficient natural heritage interest to warrant formal protection from development and other change*."

This highlights that the role of SSSI designation includes the protection of a site from inappropriate development that would lead to a site losing its interest. Paragraph 2.6 reiterates the NCC's statement of 1989 that, "*Site safeguard, that is the protection and management of the most important areas for wild flora and fauna and their habitat, is regarded as the cornerstone of conservation practice and, within this, SSSI notification is now the principal statutory means of achieving this goal*."

There is also a recent precedent for a high-profile example of a Kent site being designated as a SSSI with the intention of protecting it from development, with the designation of Lodge Hill as an extension to the Chattenden Woods SSSI, primarily for its population of breeding Nightingales. SSSI designation would ensure that the true biodiversity significance of the site is taken into full consideration when any development application is scrutinised by the planning process.

In this instance the impacts of the development will not only result in the wholesale removal of the terrestrial and freshwater habitats within the footprint of the development, but the planned dredging will damage the inter and sub-tidal muds in the estuary and damage the features of the Swanscombe MCZ. Therefore, the holistic protection of a site spanning the Peninsula and the River Thames is justified.

Among the many approaches to SSSI designation over the years, the 'exemplary site principle' is highted in Paragraph 4.8. The suggestion that the best examples of a habitat type should be protected is broadly accepted as being essential to a fit-for-purpose protected area network and as such, the best OMHPDL sites must be included. Based on the significant survey data available in the Thames Estuary over the last 20 years, the Swanscombe Peninsula is likely to be the most significant remaining brownfield site in the area for invertebrate biodiversity and should be considered in the exemplary category (see graphs in Appendix 2).

5.0 Conclusion

The Swanscombe Peninsula is an exceptional and exemplar site in a unique location within the ecological context of the Thames Estuary. Swanscombe has been shown to meet SSSI selection criteria, with regards to typicalness, fragility, size, diversity, ecological coherence, and the rarity of both species and habitats supported.

The nationally important invertebrate populations and their associated habitats alone should be considered sufficient to meet the criteria of SSSI designation, with an unparalleled associated fauna. It supports over 250 invertebrate species of conservation concern, and 50 red listed species – demonstrably greater than any known OMHPDL site in the UK. For example, its assemblage appears to exceed that of Canvey Wick in terms of number of nationally rare and scarce species, a site held up as 'the' exemplary OMHPDL site. This is despite Canvey Wick having a more extensive recording history, including intensive recording approaching its notification, and being a destination for invertebrate recorders for the last decade due to its known importance for brownfield invertebrates. The invertebrate survey data in the public domain for the Swanscombe Peninsula and made

available to Natural England has confirmed an impressive species list and it has also taken the useful step of making direct quantitative comparisons with other Thames Estuary sites accepted as being of national importance. The site is also one of only two UK sites for the Critically Endangered Distinguished jumping spider, making it of great significance to the conservation of the species and its continued existence in the UK.

OMHPDL habitats have suffered from significant losses in the Thames Estuary, despite supporting a nationally important invertebrate assemblage, with 51% of key brownfield sites lost, damaged or under threat from an existing permission between 2007 and 2013, and potential losses continuing with Tilbury 2, the redevelopment of Arena Essex and proposed Swanscombe Peninsula developments[39].

The site has notable populations across taxonomic groups, which when considered in concert, highlight a site of significantly raised biodiversity value (Table 4). Swanscombe supports breeding bird assemblage of regional importance (only three species shy of the national importance threshold) and which compares favourably with other high profile RSPB reserves in the vicinity; a plant fauna that exceeds the SSSI notification threshold in its own right and supports a population of the Endangered Man Orchid; and Local Wildlife Site level populations of mammal, reptile and amphibian species. The interest on the site also extends to the Swanscombe MCZ, which supports nationally important populations of the Wildlife & Countryside Act protected Tentacled lagoon-worm. In summary, it is evidently an outstanding biodiversity resource and in urgent need of designation as a SSSI to safeguard its overarching interest.

Feature	Significance
Terrestrial invertebrate assemblage	National
Distinguished jumping spider	National
Tentacled lagoon-worm	National
Plant assemblage	National
Freshwater invertebrate assemblage	Regional
Breeding birds	Regional
Reptiles and amphibians	Local Wildlife Site quality
Mammals	Local Wildlife Site quality

Table 4: Significance of species assemblages

There are few sites of national value for such a wide range of species, or that meet the SSSI criteria so clearly. It is the responsibility of Natural England to ensure that such sites are protected and celebrated appropriately. The protection of the Swanscombe Peninsula is key to the future biodiversity of the Thames Estuary.

Recommendations

1) It is essential that a new SSSI be established that incorporates all of the Swanscombe features and general interest, as outlined in 'Map 1: Swanscombe Peninsula'.

2) As an NSIP application for the site has now been accepted for examination, and due to Swanscombe's unparalleled importance for UK biodiversity, the designation must be fast tracked within Natural England's designations programme.

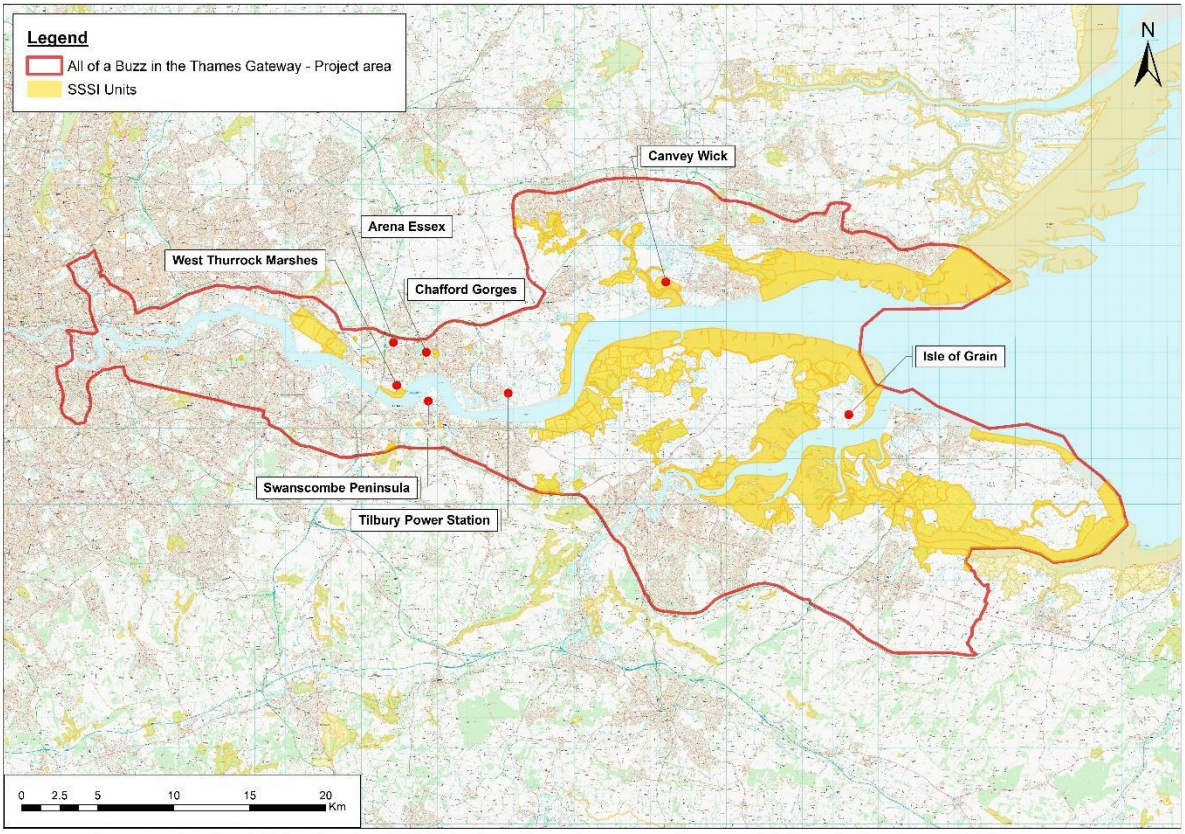
[39] Robins, J. et al. (2013) op. cit.

Acknowledgements

Jamie Robins, Matt Shardlow and Craig Macadam at Buglife, Richard Bloor and Nicky Britton-Williams at Kent Wildlife Trust, and Mark Nowers at RSPB. With advice from Chris Gibson. Thanks to the surveyors who have undertaken work on the Swanscombe Peninsula.

Appendices

Appendix 1- Area of search showing remaining high quality OMHPDL sites and SSSI designations
Area of Search has been defined as the All of a Buzz in the Thames Gateway boundary, previously agreed by Buglife and Natural England.



Map of key brownfield/OMHPDL sites in the Thames Estuary and the SSSI network within the 'All of a Buzz in the Thames Gateway' Area of Search. Contains Ordnance Survey OpenData © Crown copyright.

Appendix 2- Comparison of biodiversity significance of Swanscombe with other key remaining Thames Estuary invertebrate sites

Taken from Invertebrate Survey and Assessment of the London Paramount Entertainment Resort (2015), produced by Edwards Ecological Services Ltd, on behalf of Chris Blandford Associates

(NB Swanscombe is identified here by the London Resort's former name of London Paramount Entertainment Resort).

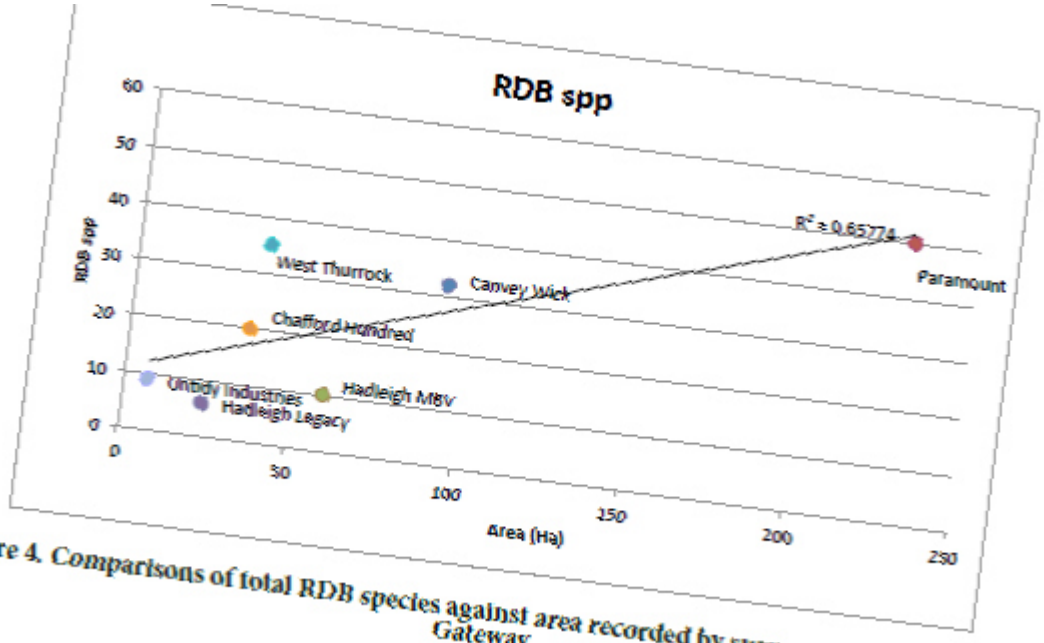
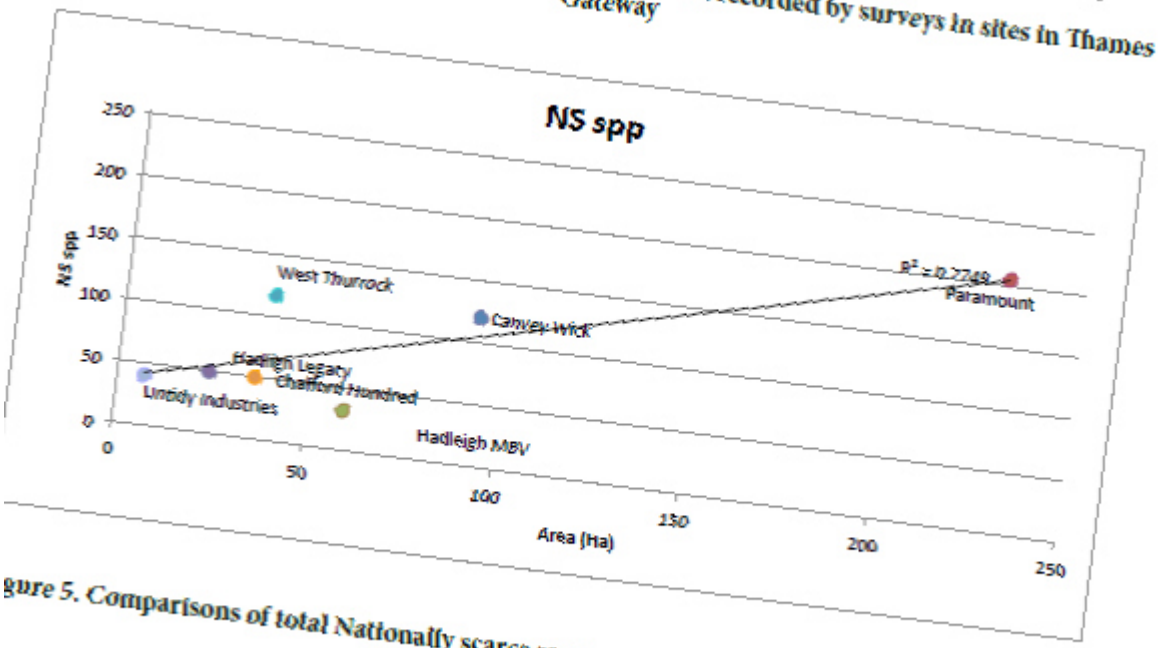


Figure 4. Comparisons of total RDB species against area recorded by surveys in sites in Thames Gateway



gure 5. Comparisons of total Nationally scarce species against area recorded by surveys in Thames Gateway

Appendix 3- 50 Red Data Book invertebrate species recorded on Swanscombe Peninsula

Data extracted from Invertebrate Survey and Assessment of the London Paramount Entertainment Resort (2015), produced by Edwards Ecological Services Ltd, on behalf of Chris Blandford Associates

Group	Family	Species	Conservation Status
Spiders	Clubionidae	*Clubiona juvensis*	RDB2
Spiders	Linyphiidae	*Praestigia duffeyi*	RDB3
Spiders	Lycosidae	*Arctosa fulvolineata*	RDB3
True bugs	Coreidae	*Gonocerus acuteangulatus*	RDB1
True bugs	Miridae	*Lygus pratensis*	RDB3
Beetle	Carabidae	*Anisodactylus poeciloides*	RDB3
Beetle	Coccinellidae	*Nephus quadrimaculatus*	RDB2
Beetle	Cryptophagidae	*Atomaria scutellaris*	RDBK
Beetle	Curculionidae	*Bagous argillaceus*	RDB2
Beetle	Curculionidae	*Coelositona cinerascens*	RDBK
Beetle	Mordellidae	*Mordellistena acuticollis*	RDBK
Beetle	Mordellidae	*Mordellistena neuwaldeggiana*	RDBK
Beetle	Mordellidae	*Mordellistena pseudoparvula*	RDBK
Beetle	Phalacridae	*Olibrus flavicornis*	RDBK
Beetle	Staphylinidae	*Tachinus flavolimbatus*	RDBK
Beetle	Throscidae	*Trixagus gracillus*	RDB3
Beetle	Urodontidae	*Bruchela rufipes*	RDB3
Fly	Conopidae	*Myopa strandi*	RDB3
Fly	Limoniidae	*Dicranomyia danica*	RDB3
Fly	Limoniidae	*Limonia masoni*	RDB3
Fly	Syrphidae	*Chrysotoxum elegans*	RDB3
Fly	Syrphidae	*Lejops vittatus*	RDB2
Fly	Syrphidae	*Parhelophilus consimilis*	RDB2
Fly	Syrphidae	*Pipizella maculipennis*	RDB3
Fly	Tabanidae	*Hybomitra ciureai*	RDB3
Fly	Tachinidae	*Cistogaster globosa*	RDB1
Fly	Tachinidae	*Gymnosoma nitens*	RDB1
Fly	Tachinidae	*Gymnosoma rotundatum*	RDB3
Fly	Tephritidae	*Campiglossa malaris*	RDBK
Fly	Tephritidae	*Myopites inulaedyssentericae*	RDB3
Fly	Therevidae	*Thereva fulva*	RDB3
Fly	Ulidiidae	*Dorycera graminum*	RDB3
Bee	Andrenidae	*Andrena alfkenella*	RDB3
Bee	Andrenidae	*Andrena florea*	RDB3
Bee	Andrenidae	*Andrena nigrospina*	RDB2
Bee	Andrenidae	*Andrena niveata*	RDB2
Bee	Apidae	*Ceratina cyanea*	RDB3
Bee	Apidae	*Nomada fulvicornis*	RDB3
Bee	Apidae	*Nomada hirtipes*	RDB3
Wasp	Crabronidae	*Cerceris quinquefasciata*	RDB3

Group	Family	Species	Conservation Status
Wasp	Crabronidae	*Crossocerus distinguendus*	RDB3
Wasp	Crabronidae	*Gorytes laticinctus*	RDB3
Wasp	Crabronidae	*Passaloecus clypealis*	RDB2/ pRDB3
Wasp	Crabronidae	*Pemphredon rugifera*	RDB3
Ant	Formicidae	*Myrmica speciodes*	RDB3
Bee	Halicitidae	*Lasioglossum pauperatum*	RDB3
Bee	Halicitidae	*Sphecodes niger*	RDB3
Bee	Halicitidae	*Sphecodes scabricollis*	RDB3
Bee	Megachilidae	*Stelis ornatula*	RDB3
Wasp	Vespidae	*Dolichovespula saxonica*	RDBK